

Environmental Protection Agency

Pt. 60, App. A-4, Meth. 10B

well as the overall mean of the response factor values. The instrument linearity is acceptable if the average response factor of each calibration gas is within 2.5 percent of the overall mean value and if the relative standard deviation (calculated in Section 12.8 of Method 25) for each set of triplicate injections is less than 2 percent. Record the overall mean of the response factor values as the calibration response factor (R).

11.0 Analytical Procedure

11.1 Preparation for Analysis. Before putting the GC analyzer into routine operation, conduct the calibration procedures listed in Section 10.0. Establish an appropriate carrier flow rate and detector temperature for the specific instrument used.

11.2 Sample Analysis. Purge the sample loop with sample, and then inject the sample. Analyze each sample in triplicate, and calculate the average sample area (A). Determine the bag CO concentration according to Section 12.2.

12.0 Calculations and Data Analysis

Carry out calculations retaining at least one extra significant figure beyond that of the acquired data. Round off results only after the final calculation.

12.1 Nomenclature.

A = Average sample area.

B_w = Moisture content in the bag sample, fraction.

C = CO concentration in the stack gas, dry basis, ppm.

C_b = CO concentration in the bag sample, dry basis, ppm.

F = Volume fraction of CO₂ in the stack, fraction.

P_{bar} = Barometric pressure, mm Hg.

P_w = Vapor pressure of the H₂O in the bag (from Table 10A-2, Method 10A), mm Hg.

R = Mean calibration response factor, area/ppm.

12.2 CO Concentration in the Bag. Calculate C_b using Equations 10B-1 and 10B-2. If condensate is visible in the Tedlar bag, calculate B_w using Table 10A-2 of Method 10A and the temperature and barometric pressure in the analysis room. If condensate is not visible, calculate B_w using the temperature and barometric pressure at the sampling site.

$$B_w = \frac{P_w}{P_{bar}} \quad \text{Eq. 10B-1}$$

$$C_b = \frac{A}{R(1 - B_w)} \quad \text{Eq. 10B-2}$$

12.3 CO Concentration in the Stack

$$C = C_b(1 - F) \quad \text{Eq. 10B-3}$$

13.0 Method Performance. [Reserved]

14.0 Pollution Prevention. [Reserved]

15.0 Waste Management. [Reserved]

16.0 References

Same as in Method 25, Section 16.0, with the addition of the following:

1. Butler, F.E., J.E. Knoll, and M.R. Midgett. Development and Evaluation of Methods for Determining Carbon Monoxide Emissions. Quality Assurance Division, Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC. June 1985. 33 pp.

17.0 Tables, Diagrams, Flowcharts, and Validation Data. [Reserved]

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EDITORIAL NOTE: For FEDERAL REGISTER citations affecting part 60, appendix A see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and on GPO Access.

APPENDIX A-5 TO PART 60—TEST METHODS 11 THROUGH 15A

Method 11—Determination of hydrogen sulfide content of fuel gas streams in petroleum refineries

Method 12—Determination of inorganic lead emissions from stationary sources

Method 13A—Determination of total fluoride emissions from stationary sources—SPADNS zirconium lake method

Method 13B—Determination of total fluoride emissions from stationary sources—Specific ion electrode method

Method 14—Determination of fluoride emissions from potroom roof monitors for primary aluminum plants

Method 14A—Determination of Total Fluoride Emissions from Selected Sources at Primary Aluminum Production Facilities

Method 15—Determination of hydrogen sulfide, carbonyl sulfide, and carbon disulfide emissions from stationary sources

Method 15A—Determination of total reduced sulfur emissions from sulfur recovery plants in petroleum refineries

The test methods in this appendix are referred to in §60.8 (Performance Tests) and §60.11 (Compliance With Standards and Maintenance Requirements) of 40 CFR part 60, subpart A (General Provisions). Specific uses of these test methods are described in the standards of performance contained in the subparts, beginning with Subpart D.